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(54) SILVER HALIDE PHOTOSENSITIVE MATERIAL

(57)Abstract:

PURPOSE: To produce the subject material which is more stable and inexpensive in environmental cost in respect of environmental measures, safety and fire prevention measures by transferring both material and stage to a water base in the production of a transparent magnetic body layer and a metal oxide particulate layer having clarity required as a photographic sensitive material and high stability of magnetic input/output with an ultramicro magnetic powder amount, capable of preventing deterioration in durability due to friction and wear, capable of preventing an elimination of the magnetic powder and metal oxide particulates due to a development processing liq., capable of preventing foaming at the time of production of a coating material, capable of omitting an after-treatment such as vacuum defoaming and ultrasonic defoaming, excellent in antistatic effect and hardly causing dust sticking after being developed.

CONSTITUTION: In the photographic sensitive material having a photosensitive silver halide emulsion layer on at least one side of the supporting body, the material has at least one layer of a transparent magnetic body layer on at least one side of the photographic sensitive material, a binder used to the transparent magnetic body layer is water-based emulsion resin and/or water-soluble resin and the transparent magnetic body layer is incorporated with at least ≥ 1 kind surfactant having HLB within a range of 1-15.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the silver halide photosensitive material which has a transparency magnetic-recording layer.

[0002]

[Description of the Prior Art] To silver halide photosensitive material, for example, the class and serial number of photosensitive material, A manufacture name, emulsion Various kinds of information about photosensitive material, such as No., At the time of photography day -, for example, a diaphragm, the exposure time, the conditions of lighting, a use filter, Various kinds of information at the time of camera photography of the magnitude of the weather and a photography frame, the model of motion picture camera, use of an anamorphic lens, etc., For example, various kinds of information required at the time of the print of selection of print number of sheets and a filter, liking of a customer's color, the magnitude of a trimming frame, etc., For example, it is required also from from [after that improvement in print quality and a print activity increase the efficiency also from on management] to input various kinds of information acquired at the time of the print of selection of print number of sheets and a filter, liking of a customer's color, the magnitude of a trimming frame, etc., other customer information, etc.

[0003] In the conventional photosensitive material, information, such as a diaphragm and the exposure time, was optically inputted slightly [it is impossible to input all these information and] at the time of photography day - at the time of photography. And it exists [the means] and was impossible to have inputted the above-mentioned information into photosensitive material at the time of a print.

[0004] From the place for a magnetic-recording method where record/playback is easy, using a magnetic-recording method, in order to input various kinds of above-mentioned information into photosensitive material is studied, and various techniques are proposed.

[0005] For example, the magnetic-recording layer of the shape of a stripe which distributed the particle of a ferromagnetic is prepared in the horizontal emulsion side or horizontal back side of the image section. Recording information, such as voice and conditions at the time of photography, JP,50-62627,A, A 49-4503 official report, a U.S. Pat. No. 3,243,376 specification, It is indicated by this No. 3,220,843 specification etc. to moreover, the back side of photosensitive material Preparing the transparency magnetic-recording layer which chose the amount of a magnetizability particle, size, etc. and acquired required transparency is indicated by the U.S. ***** No. 3,782,947 specification, this No. 4,279,945 specification, this No. 4,302,523 specification, etc. Moreover, the U.S. Pat. No. 4,947,196 specification and the camera for photography which has the magnetic head with the roll-like film which has the magnetic-recording layer which contained the magnetic substance which makes magnetic recording possible at the rear face of a photographic film in WO 90/No. 04254 are indicated.

[0006] By preparing these magnetic-recording layers, it becomes possible to record various kinds of conventionally difficult above-mentioned information into photosensitive material, and has further the possibilities that voice and a picture signal are also recordable.

[0007] However, since the method of preparation of the conventional magnetic-recording layer applied

to a base material after distributing the particle of magnetic powder to the binder containing an organic solvent, it was difficult [it] to design a simple production facility from an environment and many problems on the cure and disaster prevention of the versatility on insurance. Moreover, since the surface characteristic is an oxide fundamentally and a magnetic powder child is a hydrophilic property, on the occasion of distribution, it is known conventionally that the medium of a hydrophilic property or water is fundamentally better than an oleophilic dispersion-medium object. For this reason, in order to improve the compatibility and wettability with a binder or an organic solvent of magnetic powder, efforts of surface treatment are also performed so that JP,57-111829,A and JP,60-69819,A may see.

[0008] Furthermore, in order that silver halide photosensitive material may surely perform developments, such as a wet process, drainage system processing, or heat-treatment, unlike magnetic-recording media, such as a common floppy disk and a common video tape, and an audio tape, new engine performance, such as a water resisting property and alkali resistance, is needed. Since the conventional magnetic-recording medium did not have these engine performance, if a development was performed as it is, photosensitive material -- the binder which is distributing magnetic powder dissolves or swells, magnetic powder, a dispersant, and lubricant dissociate from a paint film, and pollute downstream processing and the film itself, or the binder itself causes discoloration or deformation -- was sometimes plentifully made to produce a fatal defect.

[0009] Moreover, when the monomer contained in a binder, the residual monomer by un-constructing [of a hardening agent] a bridge, etc. existed, sensitization of a photograph was affected, and it sometimes became the cause which causes fogging and poor coloring plentifully.

[0010] Therefore, in order to be limited considerably and to put in practical use, the quite advanced distributed technique, the cross linking technique, the slipping nature grant technique, etc. were required for the binder which can be used for this invention, and it was very impossible level with the conventional technique.

[0011] That the surfactant contains in photosensitive material from the former Moreover, JP,4-73736,A, Although indicated by 4-73735, 4-62543, 4-96052, 4-73744, 4-124635, 4-124636, 4-124637, etc. The surface protective layer from which all constitute photosensitive material, an emulsion layer, an interlayer, undercoat, It remains in publication of containing in at least one of back layers, there is no clear publication of containing in a transparency magnetic layer, and the purpose is also shown only as a spreading assistant, an emulsification dispersant, and a photograph property amelioration agent of sensitization and others.

[0012] Furthermore, although it is also indicated by JP,58-159232,A, 63-266630, etc. that the surfactant contains in a magnetic-recording medium from the former, all remain in the publication of being used for the purpose as a spreading assistant, polymerization inhibitor, and a terminator, and it is impossible absolutely to attain the purpose of this invention which carries out a postscript.

[0013] Moreover, although drainage system processing of a magnetic powder front face is indicated by JP,3-109701,A and 2-307202, since it is used in order for all to raise the dispersibility of the magnetic powder to the inside of an organic system coating, it completely differs from this invention.

[0014] Moreover, although used in JP,55-1632,A and 55-1633 for the improvement in dispersibility of magnetic powder High dispersibility since an application is a magnetic-recording object, to the extent that transparency required as a photosensitive material is acquired, and the stability of the magnetic I/O with the magnetic powder volume of ultralow volume, Furthermore, in order to prevent most foaming which is not about cautions if it is ** trap ***** when carrying out prevention of the desorption of an additive and drainage system distribution of a magnetic powder metallurgy group oxide particle with the development liquid of photosensitive material etc. It was absolutely impossible level and was in the situation which cannot but carry out after treatment, such as vacuum degassing and ultrasonic degassing.

[0015]

[Problem(s) to be Solved by the Invention] The 1st purpose of this invention is to offer an outstanding silver halide photosensitive material in which transparency required as a photosensitive material, the Takayasu quality of the magnetic I/O with the magnetic powder volume of ultralow volume, prevention

of endurance degradation by friction and wear of the magnetic head, prevention of the desorption of a magnetic powder metallurgy group oxide particle with development liquid, prevention of foaming at the time of coating production, and deletion of after treatment, such as vacuum degassing and ultrasonic degassing, are possible.

[0016] The 2nd purpose is to offer an outstanding silver halide photosensitive material which is excellent in antistatic nature and does not have the dust adhesion after a development.

[0017] An ingredient and a process move preparation of a transparence magnetic layer and a metallic-oxide particle layer to a drainage system, and the 3rd purpose is the field of an environmental cure, and safety and the cure against flame proofing, is more safe and is to offer silver halide photosensitive material with cheap environmental costs.

[0018] The 4th purpose is containing a ferromagnetic particle and a metallic-oxide particle in the same layer, and is to offer the silver halide photosensitive material with which the cost cut by reduction of the process load by reduction, reduction of the amount of the ingredient used, etc. of the count of spreading at the time of production, the count of desiccation, etc. was measured.

[0019]

[Means for Solving the Problem] The above-mentioned purpose of this invention is attained by any of following configuration ** - ** they are.

[0020] ** Silver halide photosensitive material which the binders which have at least one layer of transparence magnetic layers at least on one side of this photosensitive material, and are used for this transparence magnetic layer in the photosensitive material which has a photosensitive silver halide emulsion layer at one [at least] base material side are aquosity emulsion resin and/or water soluble resin, and is characterized by containing at least one or more sorts of surfactants which have HLB in the range of 1-15 at this transparence magnetic layer.

[0021] ** It has at least one layer of transparence magnetic layers at least on one side of this photosensitive material. And Zn, Ti, Sn, aluminum, In, Si, Mg, Ba, Mo, W, and V are used as a principal component at least at one side of this photosensitive material. And it has at least one layer of layers containing at least one sort chosen from a metallic-oxide particle with a mean particle diameter of 1 micrometer or less. And silver halide photosensitive material with which the binders used for this metallic-oxide particle layer are aquosity emulsion resin and/or water soluble resin, and are characterized by containing at least one or more sorts of surfactants which have HLB in this metallic-oxide particle layer in the range of 1-15.

[0022] ** The above-mentioned ** characterized by containing the surfactant both which has the surfactant which has HLB in the range of 1-5 in this transparence magnetic layer and/or this metallic-oxide particle layer, and HLB in the range of 6-10, or silver halide photosensitive material given in **.

[0023] ** The above-mentioned ** characterized by this photosensitive material being silver halide color photography sensitive material, **, or silver halide photosensitive material given in **.

[0024] ** Silver halide photosensitive material given in either the above-mentioned ** to which the amount of surfactants contained in this transparence magnetic layer and/or this metallic-oxide particle layer is characterized by being 0.2 - 50wt% to this ferromagnetic and/or this metallic-oxide particle - **.

[0025] ** The above-mentioned ** characterized by the ferromagnetic used for this transparence magnetic layer being at least one sort chosen from a ferromagnetic iron-oxide particle, the ferromagnetic iron-oxide particle of Co dope, a ferromagnetic chromium dioxide particle, a ferromagnetic metal particle, and a barium ferrite, **, **, or silver halide photosensitive material given in **.

[0026] ** Silver halide photosensitive material given in any of the above-mentioned ** characterized by containing at least one sort chosen as this metallic-oxide particle layer from a ferromagnetic iron-oxide particle, the ferromagnetic iron-oxide particle of Co dope, a ferromagnetic chromium dioxide particle, a ferromagnetic metal particle, and a barium ferrite - ** they are.

[0027] ** Silver halide photosensitive material given in any of the above-mentioned ** to which the ferromagnetic used for this photosensitive material is characterized by being the impalpable powder more than specific-surface-area of 30m²/g, ** - ** they are.

[0028] ** Silver halide photosensitive material given in either the above-mentioned ** characterized by this transparency magnetic layer and/or this metallic-oxide particle layer existing in the opposite side through a photosensitive silver halide emulsion layer and a base material - **.

[0029] Namely, we are that HLB contains the surfactant of the range of 1-15 every day wholeheartedly as a result of examination that the trouble of said Prior art should be solved. [raising the separability of additives, such as a magnetic powder metallurgy group oxide particle, and] It finds out that prevention of the desorption of additives, such as a magnetic powder metallurgy group oxide particle with transparency required as a photosensitive material, the stability of the magnetic I/O with the magnetic powder volume of ultralow volume, and development liquid, prevention of foaming at the time of coating production, and deletion of said degassing processing are possible.

[0030] Furthermore, it finds out that the improvement in endurance by the further improvement in transparency, the improvement in stability of magnetic I/O, friction of the magnetic head, and wear is possible because the surfactant of the range of 1-5 and HLB contain [HLB] both of surfactants of the range of 6-10.

[0031] Hereafter, this invention is explained to a detail.

[0032] The transparency in this invention points out the case where the maximum of the optical density of a magnetic-recording layer is specifically 1.5 or less. The optical density in this invention points out the thing of the optical density Db, Dg, and Dr measured through Filters B, G, and R using optical-density meter PDA-65. Maximum in this is set to Dmax. Although there should just be 1.5 less than maximum Dmax of the optical density of the magnetic-recording layer of this invention, when the effect on a photograph is taken into consideration, a small thing is desirable and is 0.3 or less especially preferably 0.8 or less preferably.

[0033] A barium ferrite etc. can be used in ferromagnetic iron-oxide impalpable powder, the ferromagnetic iron-oxide impalpable powder of Co dope, ferromagnetic chromium dioxide impalpable powder, ferromagnetic metal powder, and the end of a ferromagnetic alloy powder as ferromagnetic impalpable powder used for the transparency magnetic layer of this invention.

[0034] As an example in the end of a ferromagnetic alloy powder, the amount of metal is more than 75wt%, and more than 80wt% for a metal is at least one kind of ferromagnetic metal, or alloys (Fe, Co, nickel, Fe-Co, Fe-nickel, Co-nickel, Co-Fe-nickel, etc.). Other components (aluminum, Si, S, Sc, Ti, V, Cr, Mn, Cu, Zn, Y, Mo, Rh, Pd, Ag, Sn, Sb, B, Ba, Ta, W, Re, Au, Hg, Pb, P, La, Ce, Pr, Nd, Te, Bi, etc.) less than [20wt%] for this metal What is included can be raised. Moreover, little water, a hydroxide, or an oxide may be included by the amount of above-mentioned ferromagnetic metal.

[0035] The process of these ferromagnetic powder is known and can be manufactured according to a well-known approach also about the ferromagnetic powder used by this invention.

[0036] The configuration of ferromagnetic powder and size can be used especially widely without a limit. Although any are sufficient as the shape of the shape of a needle and a grain of rice, a globular shape, and a cube, tabular, etc. as a configuration, a needle and tabular are desirable on a magnetic parametric performance. Although especially a limit does not have microcrystal size and specific surface area, either, more than 20m²/g is desirable in microcrystal size at 400A or less and SBET, and more than 30m²/g especially is desirable. There are not pH of ferromagnetic powder and surface preparation and they can use especially a limit (surface preparation may be carried out by the matter containing elements, such as titanium, silicon, and aluminum, and processed with an organic compound like an adsorbent compound with ** nitrogen heterocycles, such as a carboxylic acid, a sulfonic acid, a sulfate, phosphonic acid, phosphoric ester, and benzotriazol). The range of desirable pH is 5-10. In the case of ferromagnetic iron-oxide impalpable powder, it can do [using without being restricted to especially the ratio of divalent iron / trivalent iron, or]. These magnetic-recording layers are indicated by JP,47-32812,A and 53-109604.

[0037] independent in what is thermoplastics, radiation-curing nature resin, thermosetting resin, and other reaction type resin as a binder used for a magnetic-recording layer, and was dissolved or distributed by water -- or it can be mixed and used.

[0038] As the above-mentioned thermoplastics, a vinyl chloride vinyl acetate copolymer, vinyl chloride

resin, The copolymer of vinyl acetate resin, vinyl acetate, and vinyl alcohol, the vinyl chloride vinyl acetate copolymer which carried out partial hydrolysis, A vinyl chloride-vinylidene-chloride copolymer, a vinyl chloride-acrylonitrile copolymer, An ethylene-vinylalcohol copolymer, a chlorination polyvinyl chloride, an ethylene-vinyl chloride copolymer, A vinyl system polymer or copolymers, such as an ethylene-vinylacetate copolymer, Cellulosics, such as a nitrocellulose, cellulose acetate propionate, and cellulose-acetate-butylate resin, The copolymer of a maleic acid and/or an acrylic acid, an acrylic ester copolymer, An acrylonitrile styrene copolymer, chlorinated polyethylene, and acrylonitrile-chlorinated polyethylene-styrene copolymer, Methyl methacrylate-Butadiene Styrene, acrylic resin, Polyvinyl-acetal resin, polyvinyl butyral resin, polyester polyurethane resin, Polyether polyurethane resin, polycarbonate polyurethane resin, Rubber system resin, such as polyester resin, polyether resin, polyamide resin, amino resin, styrene-butadiene resins, and butadiene-acrylonitrile resin, silicone system resin, fluororesin, etc. can be mentioned.

[0039] the above-mentioned thermoplastics -- Tg - it is 30 degrees C - 150 degrees C preferably, and that whose weight average molecular weight is 5,000-300,000 is desirable still more desirable, and 40 degrees C - 180 degrees C of weight average molecular weight are the thing of 10,000-200,000.

[0040] These can usually be used as a drainage system emulsion or the drainage system colloidal solution. The particle size of these synthetic-resin system emulsion can use a 2-micrometer thing from 5nm.

[0041] Radiation-curing nature resin is resin stiffened with radiations, such as an electron ray and ultraviolet rays, it is a thing a maleic-anhydride type, an urethane acrylic type, an ether acrylic type, and epoxy acrylic type, and the thing of a drainage system emulsion is mentioned.

[0042] Moreover, as thermosetting resin and other reaction type resin, the thing of water solubility or a drainage system emulsion is mentioned by phenol resin, an epoxy resin, polyurethane system hardening mold resin, the urea-resin, the alkyd resin, silicone system hardening mold resin, etc.

[0043] The binder of the above-mentioned listing may have the polar group in the molecule. As a polar group, an epoxy group, -COOM, -OH, -NR₂, -NR₃X, -SO₃M, -OSO₃M, -PO₃M₂, and -OPO₃M (R expresses hydrogen and an alkyl group for the acid with which M forms hydrogen, alkali metal, and ammonium and X forms an amine salt, respectively, respectively.) are mentioned.

[0044] in addition -- as the hydrophilic binder which can be used for this invention -- research disclosure No.17643 and 26 pages -- and -- said -- No.18716, the water-soluble polymer indicated by 651 pages, cellulose ether, a latex polymer, and water-soluble polyester can be mentioned.

[0045] As a water-soluble polymer (gelatin), a gelatin derivative, casein, an agar, sodium alginate, starch, BORIBINIRU alcohol, an acrylic-acid system copolymer, a maleic-anhydride copolymer, etc. are mentioned other than the above-mentioned, and methyl cellulose, a carboxymethyl cellulose, hydroxyethyl cellulose, hydroxypropylcellulose, etc. are mentioned as cellulose ether.

[0046] When using a water-soluble polymer, it is desirable to use a hardening agent. As a hardening agent which can be used, for example The aldehyde system compounds like formaldehyde and glutaraldehyde Diacetyl, the ketone compounds like cyclopentane dione, a screw (2-chloro ethylurea), 2-hydroxy - 4, 6-dichloro-1,3,5-triazine, a U.S. Pat. No. 3,288,775 specification, This No. 2,732,303 specification, the British patent No. 974,723 specification, The compounds which have the reactant halogen indicated by this No. 1,167,207 specification etc. A divinyl sulfone, the 5-acetyl -1, 3-diacryloyl hexahydro-1,3,5-triazine, A U.S. Pat. No. 3,635,718 specification, this No. 3,232,763 specification, Compounds with the reactant olefin indicated by the British patent No. 994,869 specification etc. N-hydroxymethyl phthalimide, a U.S. Pat. No. 2,732,316 specification, N-methylol compound indicated by this No. 2,586,168 specification etc., The isocyanate indicated by the U.S. Pat. No. 3,103,437 specification etc. The aziridine compounds indicated by the U.S. Pat. No. 3,017,280 specification, this No. 2,983,611 specification, etc. The acid derivatives indicated by the U.S. Pat. No. 2,725,294 specification, this No. 2,725,295 specification, etc. The epoxy compounds and the halogen carboxy aldehydes like mucochloric acid which are indicated by the U.S. Pat. No. 3,091,537 specification etc. can be mentioned. Moreover, the carboxyl group active type hardening agent which a mineralization system hardening agent can also be used, and a chromium ** van and a sulfuric-acid zirconium are

mentioned as a mineralization system hardening agent, and is indicated by JP,56-12853,B, a 58-32699 official report, the Belgium patent No. 825,726 specification, JP,60-225148,A, JP,51-126125,A, JP,58-50699,B, JP,52-54427,A, the U.S. Pat. No. 3,321,313 number specification, etc. can be mentioned.

[0047] A hardening agent is used 0.01 to 60% of the weight to resin solid content, and is usually 0.05 - 50 % of the weight preferably.

[0048] As lubricant, plastics impalpable powder, such as silicone oil, such as a polysiloxane, polyethylene, and polytetrafluoroethylene, a higher fatty acid, higher-fatty-acid ester, and fluorocarbon are mentioned. these are independent -- or it can mix and use. These additions can be used in the range of 0.2 - 20 weight section to the binder 100 weight section. Whether it melting into water and the thing which can be diffused are desirable.

[0049] As an abrasive material, five or more, six or more nonmagnetic inorganic powder is mentioned preferably, and, specifically, Mohs hardness can mention impalpable powder, such as carbide, such as oxides, such as oxide aluminum (alpha-alumina, gamma-alumina, corundum, etc.), chromic oxide (Cr 2O3), ferrous oxide (alpha-Fe 2O3), a silicon dioxide, and a titanium dioxide, silicon carbide, and titanium carbide, and a diamond. Such mean particle diameter has desirable 0.01-1.0 micrometers, and they can add it in the range of 0.5 - 30 weight section to the magnetic-substance powder 100.

[0050] As an antistatic agent, the particle of a metallic oxide is desirable.

[0051] as the example of a metallic oxide -- Nb2O5+X -- an oxide with superfluous oxygen [like] -- Oxygen deficiency oxides, such as RhO2-X and Ir2O3-X, or an indeterminate ratio hydride like nickel (OH) X, HfO2, ThO2, ZrO2, CeO2, ZnO, TiO2, SnO2, aluminum 2O3, In2O3, SiO2, MgO, BaO and MoO2, V2O5 grades, or these multiple oxides are desirable, and especially ZnO, TiO2, and SnO2 are desirable. To addition of aluminum, In, etc., and TiO2, addition of Sb, Nb, a halogen, etc. is effective as an example containing a heteroatom to addition of Nb, Ta, etc., and SnO2 to ZnO, for example.

Although the addition of these heteroatoms has the desirable 0.01-mol % - 25-mol range of %, the 0.1-mol % - 15-mol especially range of % is desirable.

[0052] Moreover, as for the volume resistivity of metallic-oxide fine particles which has such conductivity, it is desirable that they are 107-ohmcm, especially below 105-ohmcm. Moreover, the particle of said metallic oxide may be the sol mixed in the water solution.

[0053] In addition, you may be conductive impalpable powder, such as carbon black and a carbon black graft polymer.

[0054] as a surface active agent -- an anionic surface active agent, a cationic surface active agent, a nonionic surface active agent, an amphoteric surface active agent, and ** -- inside -- either -- you may use it independently and two or more kinds may be used together. As HLB of a surfactant, the range of 1-15 is desirable, and its HLB is more desirable, when the surfactant and HLB of the range of 1-5 use together the surfactant of the range of 6-10.



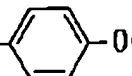
[0055] Although the example of a surfactant is raised to below, the surfactant which can be used by this invention is not restricted to below.

[0056] What contains acidic groups, such as carboxy groups, such as alkyl carboxylate, an alkyl-sulfonic-acid salt, alkylbenzene sulfonate, alkyl naphthalene sulfonate, alkyl-sulfuric-acid ester, alkyl phosphoric ester, N-acyl-N-alkyl taurines, sulfo succinate, sulfoalkyl polyoxyethylene alkylphenyl ether, and polyoxyethylene alkyl phosphoric ester, a sulfonic group, a phospho group, a sulfate radical, and a phosphoric ester radical, as an anionic surface active agent is desirable.

[0057] The example preferably used for this invention below is shown.

[0058] Anionic surface active agent [0059]

[Formula 1]

化合物No.	構造式	H L B
1	$C_{132}H_{265}COONa$	1.9
2	$C_{48}H_{97}COONa$	5.2
3	$C_{21}H_{43}SO_3Na$	12.2
4	$C_{52}H_{105}SO_3Na$	4.8
5	$C_{44}H_{89}OSO_3Na$	7.8
6	$C_{38}H_{77}$  SO_3Na	5.9
7	$(t)C_{11}H_{23}$  $O(CH_2CH_2O)_8CH_2CH_2OSO_3Na$	10.9
8	$(t)C_9H_{19}$  $O(CH_2CH_2O)_{12}SO_3Na$ $C_9H_{19}(t)$	8.1

[0060]

[Formula 2]

化合物No.	構造式	H L B
9	$C_{29}H_{57}CONCH_2CH_2SO_3Na$ $\quad \quad \quad $ $\quad \quad \quad CH_3$	9.9
10	$C_{41}H_{83}O(CH_2CH_2O)_{10}CONHCHCOONa$ $\quad \quad \quad \quad \quad \quad \quad $ $\quad \quad \quad \quad \quad \quad \quad C\ell$	7.5
11	$C_{12}H_{25}O(CH_2CH_2O)_6SO_3Na$	13.3
12	$C_{12}H_{25}COOCHSO_3Na$ $\quad \quad \quad $ $\quad \quad \quad C_{12}H_{25}COOCH_2$	12.1
13	$[C_{12}H_{25}O(CH_2CH_2O)_{10}]_2P(=O)ONa$	7.3

[0061] As a cationic surface active agent, phosphonium or sulfonium salt including heterocycle quarternary ammonium salt, such as alkylamine salts, a fatty acid or aromatic series quarternary ammonium salt, pyridinium, and imidazolium, and a fatty acid, or heterocycle etc. is desirable.

[0062] The example preferably used for this invention below is shown.

[0063] Cationic surface active agent [0064]

[Formula 3]

化合物No.	構造式	HLB
14	$C_{57}H_{105}NH_3 \cdot Cl$	3.5
15	$C_{153}H_{307}NH_3 \cdot Cl$	1.3
16	$C_{133}H_{267}NH_3 \cdot Cl$	1.5
17	$C_{51}H_{103} - \text{N}^+ \text{ (cyclohexyl)} \cdot Cl^-$	3.7
18	$C_{11}H_{23}NH_3 \cdot Cl$	17.9
19	$C_{12}H_{25}NH_3 \cdot Cl$	16.7
20	$C_{16}H_{33} - \text{N}^+ \text{ (pyridyl)} - CH_3 \cdot Cl^-$	9.3

[0065]

[Formula 4]

化合物No.	構造式	HLB
21	$C_{22}H_{45} - \text{C}_6\text{H}_4 - \text{NH}_3^+ \cdot Cl^-$	7.4
22	$C_{13}H_{27} - \text{N}^+ - \text{CH}_2\text{COO}^-$ $[(CH_2CH_2O)_6H]_2$	8.4
23	$\begin{array}{c} CH_2-CH_2 \\ \quad \\ N=C-N^+ \\ \quad \\ C_{12}H_{25} \quad (CH_2CH_2O)_6H \end{array} \text{CH}_2\text{COO}^-$	9.5
24	$\begin{array}{c} CH_3CH_3 \\ \diagup \quad \diagdown \\ S^+ \\ \\ C_{10}H_{21} \end{array} \cdot Cl^-$	12.5

[0066] as a nonionic surface active agent -- a saponin (steroid system) and an alkylene oxide derivative (for example, a polyethylene glycol --) A polyethylene glycol / polypropylene-glycol condensate, polyethylene glycol alkyl ethers, or polyethylene-glycol alkyl aryl ether, Polyethylene glycol ester and polyethylene-glycol sorbitan ester POREARUKIREN glycol alkylamine or amides, and the polyethylene oxide addition products of silicone A glycidol derivative (for example, an alkenyl succinic-acid poly glyceride, an alkylphenol poly glissade), the fatty acid ester of polyhydric alcohol, and the alkyl ester sugar of sugar are desirable.

[0067] The example preferably used for this invention below is shown.

[0068] Nonionic surface active agent [0069]

[Formula 5]

化合物No.	構造式	HLB
25	$C_5H_{11}O-(CH_2CH_2O)_{37}H$	7.4
26	$C_5H_{11}O-(CH_2CH_2O)_{80}H$	16.1
27	$C_2H_5(OCH_2CH_2)_4OH$	9.0
28	$CH_3COO(CH_2CH_2O)_3H$	15.7
29	$\begin{array}{c} CH_2CH_2OCOC_{11}H_{23} \\ \\ N-CH_2CH_2OH \\ \\ CH_2CH_2OH \end{array}$	9.8
30	$\begin{array}{c} CH_2CH_2OCOC_{40}CH_{81} \\ \\ N-CH_2CH_2OH \\ \\ CH_2CH_2OH \end{array}$	3.6
31	$\begin{array}{c} CH_2CH_2OH \\ \\ C_7H_{15}CON \\ \\ CH_2CH_2OH \end{array}$	15.6

[0070] As an amphoteric surface active agent, amino acid, amino alkyl sulfonic acids, amino alkyl sulfuric acid or phosphoric ester, alkyl betaines, and amine oxides are desirable.

[0071] The example preferably used for this invention below is shown.

[0072] Amphoteric surface active agent [0073]

[Formula 6]

化合物No.	構造式	HLB
32	$\begin{array}{c} CH_3 \\ \\ C_{44}H_{89}-N^+-CH_2COO^- \\ \\ CH_3 \end{array}$	4.3
33	$\begin{array}{c} CH_3 \\ \\ C_{53}H_{107}-N^+-CH_2COO^- \\ \\ CH_3 \end{array}$	3.6
	$\begin{array}{c} CH_3 \\ \\ C_{22}H_{45}-N^+-CH_2COO^- \\ \\ CH_3 \end{array}$	7.9
35	$\begin{array}{c} (CH_2CH_2O)_2SO_3Na \\ \\ C_{18}H_{37}-N \\ \\ (CH_2CH_2O)_2SO_3Na \end{array}$	9.5

[0074] HLB of the above-mentioned surfactant is a "surfactant handbook" editor. It is the value calculated by the approach West Ichiro, the Imai *****, the Kasai ****, the 3rd ** of the Sangyo Tosho Publishing Co., Ltd. issue (Showa 38.6.10), and given in the 316-317th page.

[0075] An organic solvent and water are used for the magnetic-recording medium of this invention, it distributes and kneads the above-mentioned component, applies it to a nonmagnetic base material, and after carrying out orientation if needed, it is dried and obtained. Flat-surface processing may be performed as occasion demands after desiccation.

[0076] As a solvent used in the case of distribution of this invention, kneading, and spreading By the ratio of arbitration, ketone system; methanols, such as an acetone, a methyl ethyl ketone, methyl isobutyl ketone, a cyclohexanone, an isophorone, and a tetrahydrofuran, ethanol, propanol, a butanol, isobutyl alcohol, isopropyl alcohol, Alcoholic system [, such as methyl cyclohexanol,]; Ester systems, such as methyl acetate, ethyl acetate, butyl acetate, isobutyl acetate, isopropyl acetate, ethyl lactate, an acetic-

acid glycol, and the monoethyl ether; Glycol ether system [, such as the ether, glucol wood ether, the glycol monoethyl ether and dioxane]; Tar systems, such as benzene toluene, a xylene, cresol, chlorobenzene, and styrene (aromatic hydrocarbon); Chlorinated hydrocarbon, such as a methylene chloride, ethylene chloride, a carbon tetrachloride, chloroform, ethylene chlorohydrine, and dichlorobenzene, N, Things, such as N-dimethyl formaldehyde, a hexane, and water, can be used.

[0077] As an approach of preparing a magnetic-recording layer on a base material, a slide hopper coat, the Ayr doctor coat, a blade coat, the Ayr knife coat, a squeeze coat, a **** coat, a reverse roll coat, a transfer roll coat, a gravure coat, a kiss coat, a cast coat, a spray coat, IKUSUTORYUJON, etc. can be used. What is necessary is just to make these spreading heads into a multiple string, in order to perform multi-thread stripe spreading. As the concrete approach of stripe spreading, it can refer to the publication of JP,48-25503,A, a 48-25504 official report, a 48-98803 official report, a 50-138037 official report, a 52-15533 official report, a 51-3208 official report, a 51-6239 official report, a 51-65606 official report, a 51-140703 official report, JP,29-4221,B, a U.S. Pat. No. 3,062,181 specification, and this No. 3,227,165 specification, for example.

[0078] In order to paste up these magnetic-recording layer firmly on a base material, an under coat may be prepared in a base material, and they are a chemical treatment, a mechanical process, corona discharge treatment, flame treatment, ultraviolet treatment, RF processing, glow discharge processing, activity plasma treatment, and the lasing about a base material. Surface activity-ized processing of dark acid treatment, ozonate processing, etc. may be carried out. Furthermore, an under coat may be prepared after carrying out these surface activity-ized processing.

[0079] The thing of an under coat of a drainage system latex system is desirable.

[0080] The thickness of a magnetic-recording layer has desirable 0.01-20 micrometers, and 0.05-15 micrometers is 0.1-10 micrometers still more preferably more preferably.

[0081] In the coating liquid which forms a magnetic-recording layer, in order to give functions, such as lubricative grant, electrification prevention, adhesion prevention, friction, and improvement in a **** property, to a magnetic-recording layer, various additives, such as lubricant and an antistatic agent, can be added. Moreover, to coating liquid, in order to give flexibility to for example, a magnetic-recording layer, to help distribution of the magnetic substance in the inside of coating liquid for a plasticizer otherwise and to prevent the loading of the magnetic head for a dispersant, an abrasive material can be added. Functions, such as the above-mentioned lubricative grant, electrification prevention, adhesion prevention, friction and the improvement in a **** property, and prevention of the loading of the magnetic head, may make these functional layers prepare and give apart from a magnetic-recording layer. The protective layer which adjoins a magnetic-recording layer if needed may be prepared, and damage resistance may be raised. Moreover, when preparing a magnetic-recording layer in the shape of a stripe, the transparent polymer layer which does not contain the magnetic substance may be prepared on this, and the level difference by the magnetic-recording layer may be lost. In this case, various kinds of above-mentioned functions may be given to this transparent polymer layer.

[0082] These surfactants may be contained as a substituent of a polymer.

[0083] After preparing a magnetic-recording layer, it is also possible to carry out calendaring processing of this layer top, to raise smooth nature, and to improve the S/N ratio of a magnetic output. In this case, after performing calendaring processing, it is desirable to apply a silver halide photograph sensitization layer.

[0084] After preparing a magnetic-recording layer, it is also possible to carry out calendaring processing of the layer top, to raise smooth nature, and to improve the S/N ratio of a magnetic output. In this case, after performing calendaring processing, it is desirable to apply a silver halide photograph sensitization layer.

[0085] Magnetic-substance powder is distributed with the binder emulsion-ized to underwater [which melted into water / the binder or underwater], and coating liquid is formed. A ball mill, a homomixer, a sand mill, etc. can be used for distribution of magnetic-substance powder. That is, there is especially no limit in the approach of distribution, and the addition sequence of each component etc. can set it to it suitably. A kneading machine, for example, 2 roll mills, 3 roll mills, a ball mill, a pebble mill, a TRON

mill, a Sand grinder, Szegvari (TSUEGUBARI) attritor, a high-speed impeller, a disperser, a high-speed stone mill, a high-speed impact mill, DISUPA, a kneader, a high speed mixer, a RIBOSHI blender, a kneader, an in TENSIPU mixer, a tumbler, a blender, the De Dis parser, a homogenizer, a monopodium screw extruder, a usual 2 shaft screw extruder, a usual ultrasonic disperser, etc. can be used for preparation of a magnetic coating. In this case, it is desirable to make a magnetic-substance particle piece piece scattering as much as possible, and to distribute, without damaging a magnetic-substance particle.

[0086] When forming a transparent magnetic-recording layer optically, that [a binder's] of **** for 1 - 20 weight sections is desirable to the magnetic-substance powder 1 weight section. It is 2 - 15 weight section to the magnetic-substance powder 1 weight section still more preferably. Moreover, a solvent is used in the amount which can apply easily.

[0087] In order to prevent condensation of a drainage system emulsion, pH regulator and a surfactant may be added.

[0088] In this invention, various kinds of things can be used as a base material. As a base material which can be used, the film of polyester, such as polyethylene terephthalate and polyethylenenaphthalate, a cellulose triacetate film, a cellulose-diacetate film, a polycarbonate film, a polystyrene film, a polyolefine film, etc. can be mentioned.

[0089] Especially as a polyester base material, although not limited, these copolymers, such as the condensation polymer of aromatic series dicarboxylic acid, such as a terephthalic acid, isophthalic acid, a phthalic acid, and naphthalene dicarboxylic acid, and alkylene glycol, such as ethylene glycol, 1,3-propanediol, and 1,4-butanediol, for example, polyethylene terephthalate, polyethylene -2, 6-JINAFUTA rate, polypropylene terephthalate, and polybutylene terephthalate, are mentioned.

[0090] It is desirable to use polyester with high water content as especially shown in JP,1-244446,A, a 1-291248 official report, a 1-298350 official report, a 2-89045 official report, a 2-93641 official report, a 2-181749 official report, a 2-214852 official report, JP,2-291135,A, etc. from the curliness recoverability after a development.

[0091] These polyester may have a polar group and other substituents.

[0092] As a base material in this invention, polyethylene terephthalate and polyethylenenaphthalate are desirable.

[0093] Since the above-mentioned polyester satisfies the mechanical strength of a film base material, dimensional stability, etc., it is desirable to extend in the 4 to 16 times as many range as this by surface ratio.

[0094] To the base material of this invention, a mat agent, an antistatic agent, lubricant, a surfactant, a stabilizer, a dispersant, a plasticizer, an ultraviolet ray absorbent, the conductive matter, a tackifier, a softener, a fluid grant agent, a thickener, an antioxidant, etc. can be added.

[0095] A base material can make a color contain for the purpose, such as prevention of the light piping phenomenon (**** fogging) which happens when light carries out incidence to the film which painted neutral-izing of the tint of the minimum concentration section, and a photographic-emulsion layer from an edge, and antihalation.

[0096] Although especially the class of color is not limited, when using polyester film as a base material, the thing excellent in thermal resistance is desirable on a film production process, for example, the Anthraquinone system chemistry color etc. is mentioned. Moreover, as a color tone, when aiming at light piping prevention, gray dyeing is desirable so that a common sensitive material may see. A color may mix and use one kind or two kinds or more of colors. Diaresin by Mitsubishi Kasei Corp., product made from Bayer It is possible independent or to attain a target for colors, such as MACROLEX, by mixing suitably and using.

[0097] The photosensitive material which has the magnetic-recording layer of this invention may be which sensitive material, such as the sensitive material for black and white, the sensitive material for color negatives, the sensitive material for color papers, sensitive material for color reversal, sensitive material for movies, X-ray sensitive material, sensitive material for printing, and sensitive material for microphotographs.

[0098]

[Example] Although the concrete example of this invention is described below, the mode of operation of this invention is not limited to these.

[0099] As polyester resin for example 1 <creation of base material A> base materials, it is polyethylene terephthalate (intrinsic viscosity 0.65) of S-1:marketing.

S-2: The hydrate 0.1 weight section of calcium acetate was added as an ester interchange catalyst in the dimethyl terephthalate 100 weight section and the ethylene glycol 64 weight section, and the ester exchange reaction was performed with the conventional method. To the obtained product, the ethylene glycol solution (35 % of the weight of concentration) 28 weight section of 5-sodium sulfo-JI (beta-hydroxyethyl) isophthalic acid (abbreviated name; SIP) (all five-mol /ester bonds [%]), The polyethylene-glycol (abbreviated-name :P EG.) (number average molecular weight: 4,000) 11 weight section (total weight of 8.5 % of the weight / resultant), As the antimony-trioxide 0.05 weight section, the trimethyl phosphate ester 0.13 weight section, and an antioxidant, IRUGA NOx 1010 (product made from CIBA-GEIGY) was added so that it might become 1% of the weight to a product polymer. Subsequently, it was gradually made a temperature up and reduced pressure, the polymerization was performed by 280 degrees C and 0.5mmHg, and copolymerized polyester was obtained. (Intrinsic viscosity 0.55)

A: After carrying out the vacuum drying of S-1 and S-2 at 150 degrees C respectively, it joined in the shape of a layer within the T die so that two of three sets of extruders might be used for S-2 and melting extrusion and the thickness ratio of three layers might be set to S-2:S-1:S-2=1:1:1 at 285 degrees C, and quenching solidification was carried out by cooling drum lifting, and the laminating unstretched film was obtained. At this time, the extrusion outlet of each material was adjusted and the thickness of each class was controlled. Subsequently, after carrying out horizontal extension (3.4 times) at the temperature of 95 degrees C further after vertical extension (3.4 times) by 85 degrees C, heat setting was performed at 210 degrees C, and biaxially oriented film [of 90micro of thickness] A was obtained.

[0100] Corona discharge treatment of 8W/(m2 and min) was performed to both sides of biaxially oriented film A obtained with the <creation of the film base> above, it applied so that it might become 0.8 micrometers of desiccation thickness about undercoating coating liquid B-1 in one field, the undercoating layer B-1 was formed, and it applied so that it might become 0.8 micrometers of desiccation thickness about the following undercoating coating liquid B-2 in the field of another side of said base material A, and the undercoating layer B-2 was formed.

[0101]

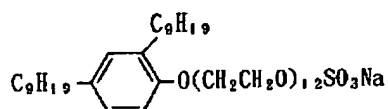
<Undercoating coating liquid B-1> 30 % of the weight of butyl acrylate, 20 % of the weight of t-butyl acrylate, 25-fold styrene Amount % and copolymer latex of 25 % of the weight of 2-hydroxyethyl acrylate Liquid (30% of solid content) 270g Compound (UL-1) 0.6g Hexamethylene -1, 6-screw (ethylene urea) 0.8g Finish with water. 1000ml <undercoating coating liquid B-2> 40 % of the weight of butyl acrylate, 20 % of the weight of styrene, glycidyl acrylate 40% of the weight of copolymer latex liquid (30% of solid content) 270g 0.6g (UL-1) of compounds Hexamethylene -1, 6-screw (ethylene urea) 0.8g Finish with water. 1000ml of corona discharge of 8W/(m2 and min) is further performed on the undercoating layer B-1 and the undercoating layer B-2. On the undercoating layer B-1 The following coating liquid B-3 was applied so that it might become 0.1 micrometers of desiccation thickness, the undercoating layer B-3 was formed, and the metallic-oxide particle layer 2 which applies the metallic-oxide particle layer coating presentation 2 given in Table 4 so that it may become 1.0 micrometers of desiccation thickness, and has an antistatic function was formed on the undercoating layer B-2.

[0102]

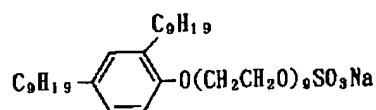
<Coating liquid B-3> Gelatin 10g Compound (UL-1) 0.2g Compound (UL-2) 0.2g Compound (UL-3) 0.1g Silica particle (mean particle diameter: 3 micrometers) 0.1g It finishes with water. 1000ml [0103]

[Formula 7]

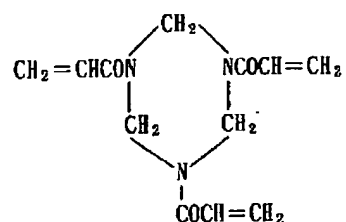
UL-1



UL-2



UL-3



[0104] After having applied the transperence magnetic layer coating presentation 1 given in Table 3 so that it might become amount of magnetic dusting 40 mg/m² after performing corona discharge treatment of 8W/(m² and min) on said metallic-oxide particle layer 2, and performing corona discharge treatment of 8W/(m² and min) on it further, the lubricating layer coating presentation 1 of the following publication was applied, and the film base 1 was produced with the configuration as shown in Table 1 and 2.

[0105]

<Lubricating layer coating presentation 1> Carnauba wax (product made from Kato Traveling abroad)

1g Pure water 700g Methanol 710g [0106]

[Table 1]

実施例構成一覽

実施例	層 構 成 表 2 記 載	透明磁性体層塗料組成 表 3 記 載	金属酸化物微粒子層塗料組成 表 4 記 載
実施例 1	1	1	2
実施例 2	2	1	2
実施例 3	2	2	2
実施例 4	2	3	2
比較例①	2	4	2
実施例 5	2	5	2
比較例②	2	6	2
実施例 6	2	7	2
実施例 7	2	8	2
実施例 8	2	9	2
比較例③	2	10	2
実施例 9	2	11	2
実施例 10	2	12	2
実施例 11	2	13	2
実施例 12	2	14	2
実施例 13	2	15	2
実施例 14	2	16	2
比較例④	2	17	2
実施例 15	2	18	2
実施例 16	2	19	2
実施例 17	2	20	2
実施例 18	2	21	2
比較例⑤	2	22	2
実施例 19	2	2	1
実施例 20	2	2	3
比較例⑥	2	2	4
比較例⑦	2	2	5
実施例 21	5	2	6
実施例 22	2	2	7
実施例 23	2	2	8
実施例 24	2	2	9
実施例 25	2	2	10
実施例 26	2	2	11
比較例⑧	2	2	12
実施例 27	2	2	13
實施例 28	2	2	14
實施例 29	2	2	15
比較例⑨	2	2	16
實施例 30	2	2	17
實施例 31	2	2	18
實施例 32	3	2	2
實施例 33	4	—	6
實施例 34	2	23	2
實施例 35	2	2	19
實施例 36	6	金属酸化物微粒子層 塗料組成 6	2

[0107]

[Table 2]

バック層構成

	層構成 1	層構成 2	層構成 3	層構成 4	層構成 5	層構成 6
層数:	4	3	3	2	3	2
ベ ン ク 層 側	潤滑層				潤滑層	
	磁性層	潤滑層	潤滑層		磁性層 + 金属	
	金属酸化物	磁性層	金属酸化物	潤滑層	酸化物微粒子層	潤滑層
	微粒子層 下引層 B-2	金属酸化物 微粒子層	微粒子層 磁性層	磁性層 + 金属酸化物 微粒子層	金属酸化物 微粒子層	磁性層 + 金属酸化物 微粒子層
支持体	支持体 A	支持体 A	支持体 A	支持体 A	支持体 A	支持体 A
乳 剂 層 側						金属酸化物 微粒子層

表 2 中：磁性層とは、透明磁性体層を意味する。

[0108]

[Table 3]

透明磁性体層塗料組成

組成No.	界面活性剤		磁性		粉		結合剤		架橋剤		溶媒		備考
	種類	化合物	添加量 (重量部)	種類	添加量 (重量部)	BET (m^2/g)	種類	添加量 (重量部)	種類	添加量 (重量部)	水添加量 (重量部)	イソプロピルアルコール 添加量(重量部)	
1	アニオン系	2	0.05	Co- α -Fe ₂ O ₃	5.1	34.2	A	670.3	-	-	182.4	194.3	実施例
2	アニオン系	2	0.6	Co- α -Fe ₂ O ₃	5.6	34.2	A	658.2	-	-	184.3	193.4	実施例
3	アニオン系	2	2.5	Co- α -Fe ₂ O ₃	7.6	34.2	A	670.0	-	-	218.2	220.9	実施例
4	アニオン系	2	3.5	Co- α -Fe ₂ O ₃	7.8	34.2	A	662.5	-	-	222.5	231.4	比較例
5	アニオン系	2	0.5	Co- α -Fe ₂ O ₃	5.6	49.8	A	649.3	-	-	190.2	189.3	実施例
6	アニオン系	2	0.7	Co- α -Fe ₂ O ₃	5.5	25.6	A	666.6	-	-	184.0	197.8	比較例
7	アニオン系	2	0.6	α -Fe ₂ O ₃	5.4	32.5	A	667.9	-	-	183.2	195.7	実施例
8	アニオン系	2	0.6	パーライト	5.5	48.3	A	668.1	-	-	187.6	192.9	実施例
9	アニオン系	2	0.7	CrO ₂	5.7	31.2	A	671.4	-	-	193.7	180.2	実施例
10	-	-	-	Co- α -Fe ₂ O ₃	5.1	34.2	A	667.4	-	-	190.5	185.1	比較例
11	アニオン系	2	0.7	Co- α -Fe ₂ O ₃	5.6	34.2	B	403.8	-	-	328.8	335.5	実施例
12	アニオン系	2	0.6	Co- α -Fe ₂ O ₃	5.5	34.2	C	207.6	-	-	420.9	430.8	実施例
13	アニオン系	2	0.6	Co- α -Fe ₂ O ₃	5.5	34.2	D	694.0	-	-	327.4	330.2	実施例
14	アニオン系	2	0.8	Co- α -Fe ₂ O ₃	6.6	34.2	E	97.8	a	73.8	528.4	526.4	実施例
15	アニオン系	2	0.8	Co- α -Fe ₂ O ₃	6.4	34.2	F	99.6	b	17.2	550.3	562.8	実施例
16	アニオン系	11	0.6	Co- α -Fe ₂ O ₃	5.5	34.2	A	661.0	-	-	194.6	198.0	実施例
17	カチオン系	19	0.5	Co- α -Fe ₂ O ₃	5.3	34.2	A	663.8	-	-	192.7	200.8	比較例
18	カチオン系	16	0.6	Co- α -Fe ₂ O ₃	5.3	34.2	A	665.1	-	-	198.8	192.3	実施例
19	両性系	33	0.7	Co- α -Fe ₂ O ₃	5.6	34.2	A	670.2	-	-	187.3	191.9	実施例
20	両性系	34	0.7	Co- α -Fe ₂ O ₃	5.7	34.2	A	659.9	-	-	197.6	190.8	実施例
21	非イオン系	27	0.6	Co- α -Fe ₂ O ₃	5.5	34.2	A	657.7	-	-	195.7	200.3	実施例
22	非イオン系	28	0.6	Co- α -Fe ₂ O ₃	5.6	34.2	A	669.2	-	-	187.3	195.1	比較例
23	カチオン系	16	0.1	Co- α -Fe ₂ O ₃	5.7	34.2	A	668.8	-	-	191.2	188.6	実施例

[0109]

[Table 4]

金属氧化物微粒子固塗料組成

組記No.	界面活性剤		金属氧化物		結合剤		磁性		溶媒		架橋剤		備考
	種類	化合物	添加量 (重量部)	種類	添加量 (重量部)	種類	種類	添加量 (重量部)	BET (m ² /g)	水添加量 (重量部)	添加量(重量部)	種類	
実施例1	アニオン系	1	0.4	A	182.0	A	-	-	-	514.9	511.3	-	実施例
実施例2	アニオン系	1	18.5	A	198.6	A	-	-	-	613.7	622.0	-	実施例
実施例3	アニオン系	1	284.9	A	633.8	A	-	-	-	2592.2	2695.7	-	実施例
比較例4	アニオン系	1	530.9	A	1041.2	A	-	-	-	4442.9	4454.5	-	比較例
比較例5	-	-	-	A	179.8	A	-	-	-	503.8	514.1	-	比較例
実施例6	アニオン系	3	20.5	A	199.3	A	Co-α-Fe ₂ O ₃	5.8	34.2	635.6	638.3	-	実施例
実施例7	アニオン系	3	19.0	A	197.8	B		-	-	748.4	742.0	-	実施例
実施例8	アニオン系	3	18.7	A	196.9	C		-	-	842.0	839.2	-	実施例
実施例9	アニオン系	3	21.7	A	211.7	E		-	-	949.7	952.8	a	73.5
実施例10	アニオン系	3	19.9	A	207.9	F		-	-	956.5	950.4	b	18.6
実施例11	カチオン系	14	18.3	A	195.8	A	-	-	-	610.3	612.5	-	実施例
比較例12	カチオン系	18	17.9	A	196.2	A	-	-	-	612.7	608.2	-	比較例
実施例13	両性系	32	18.5	A	198.3	A	-	-	-	614.9	609.0	-	実施例
実施例14	両性系	35	18.8	A	199.8	A	-	-	-	602.4	612.6	-	実施例
実施例15	非イオン系	25	18.2	A	197.4	A	-	-	-	610.1	613.3	-	実施例
比較例16	非イオン系	26	19.1	A	199.2	A	-	-	-	601.2	614.4	-	比較例
実施例17	アニオン系	4	17.8	B	198.8	A	-	-	-	605.7	618.0	-	実施例
実施例18	カチオン系	15	18.0	C	194.1	A	-	-	-	615.9	609.8	-	実施例
実施例19	アニオン系	1	6.8	A	195.9	A	-	-	-	581.8	599.3	-	実施例
	両性系	35	7.2	A		A	-	-	-			-	実施例

[0110] Binder class A -- Toyobo Co., Ltd. make BAIRONARU MD-1220B-- Goo Chemical make plus coat Z-446C-- Japan Synthetic Rubber Co., Ltd. make JSR 0693D-- Japan Synthetic Rubber Co., Ltd. make SX 808(B)-01E-- Shin-Etsu Chemical Co., Ltd. make poval PA-05GPF-- ossein gelatin cross linking agent class a-- Dai-Ichi Kogyo Seiyaku Co., Ltd. make ERASU TRON BN-69b-- Nagase Brothers -- Formation -- make -- DENAKORU EX-512 metallic-oxide class SnOby A-- Ishihara Sangyo Kaisha, Ltd.2 Powder SN-100P (mean particle diameter of 0.1 micrometers)

B -- TiO₂ by Ishihara Sangyo Kaisha, Ltd. ET-300W (mean particle diameter of 0.3 micrometers)
C -- BaSO₄ by Mitsui Mining and Smelting Co., Ltd. Powder Pasto Laon TYPE-IV (mean particle diameter of 0.2 micrometers)

Furthermore, after performing corona discharge of 25W/(m² and min) on said undercoating layer B-5, the multilayer color sensitive material which consists of an emulsion layer configuration of the Japanese-Patent-Application-No. No. 267697 [four to] written example 1 was produced, and photosensitive material 1 was produced.

[0111] In this multilayer emulsion layer, per m², a silver halide particle (gelatin 13.7g, 0.3-0.4 micrometers, and 0.7-0.8 micrometers) is 2.8g in 2.3g and the amount of oil droplets, respectively, and is 27 micrometers of thickness.

[0112] The processing liquid of a presentation shown in the produced film base, the processing process which shows photosensitive material below, and the following performed the development.

[0113] Color development 3-minute and 15-second ** White 6-minute and 30-second water ** It is a law for 2 minutes and 10 seconds. It wears. 4-minute and 20-second water ** 3-minute and 15-second ** Law The processing liquid presentation used for each process for 05 seconds per minute was as follows.

[0114]

Color developer Diethylenetriamine pentaacetic acid 1.0g The 1-hydroxy ethylidene -1, 1-diphosphonic acid 2.0g Sodium sulfite 4.0g Potassium carbonate 30.0g Potassium bromide 1.4g Potassium iodide 1.3mg Hydroxylamine sulfate 2.4g 4- (N-ethyl-N-beta-hydroxyethylamino) -2-methylaniline sulfate 4.5g Water is added. 1.0l. pH10.0 bleach liquor The second iron ammonium salt of ethylenediaminetetraacetic acid 100.0g Disodium ethylenediaminetetraacetate salt 10.0g Ammonium bromide 150.0g Ammonium nitrate 10.0g Water is added. 1.0l. pH 6.0 fixer Disodium ethylenediaminetetraacetate 1.0g sodium sulfite 4.0g Ammonium thiosulfate (70%) 175.0mg Sodium bisulfite 4.6g Water is added. 1.0l. pH 6.6 slurry Formalin (40%) 2.0mg Polyoxyethylene-p-mono-nonyl phenyl ether (average degree of polymerization 10) 0.3g Water is added. To both sides of the base material A obtained by the 1.0l. example 2 example 1 publication Perform corona discharge treatment of 8W/(m² and min), apply so that it may become 0.8 micrometers of desiccation thickness about said undercoating coating liquid B-1 in one field, and the undercoating layer B-1 is formed. Moreover, the metallic-oxide particle layer 2 which applies the metallic-oxide particle layer coating presentation 2 given in Table 4 to the field of another side of said base material A so that it may become 0.8 micrometers of desiccation thickness, and has an antistatic function in it was formed.

[0115] Corona discharge treatment of 8W/(m² and min) is performed on the undercoating layer B-1 and the metallic-oxide particle layer 2. Furthermore, on the undercoating layer B-1 Said coating liquid B-3 is applied so that it may become 0.1 micrometers of desiccation thickness, and the undercoating layer B-3 is formed. On the metallic-oxide particle layer 2 After having applied the transparence magnetic layer coating presentation 1 given in Table 3 so that it might become amount of magnetic dusting 40 mg/m², and performing corona discharge treatment of 8W/(m² and min) on it further, the lubricating layer coating presentation 1 of said publication was applied, and the film base 2 was produced with the configuration as shown in Table 1 and 2.

[0116] Furthermore, on said undercoating layer B-3, multilayer color sensitive material was produced completely like the example 1 publication, and photosensitive material 2 was produced.

[0117] A processing process and processing liquid performed the development for the film base and photosensitive material which were produced completely like the example 1 publication.

[0118] To three to example 31 example 2, except changing into a configuration Table 1 - given in Table 4, the film bases 3-31 and photosensitive material 3-31 were produced completely like the example 2, and the development was performed.

[0119] To example 32 example 3, except changing the lamination 2 given in Table 2 into 3, the film base 32 and photosensitive material 32 were produced completely like the example 3, and the development was performed.

[0120] Corona discharge treatment of 8W/(m² and min) is performed to both sides of the base material

A obtained by the example 33 example 1 publication. Apply said undercoating coating liquid B-1 to one field so that it may become 0.8 micrometers of desiccation thickness, and the undercoating layer B-1 is formed in it. Moreover, the metallic-oxide particle layer 6 which applies the metallic-oxide particle layer coating presentation 6 given in Table 4 to the field of another side of said base material A so that it may become 0.8 micrometers of desiccation thickness, and has an antistatic function in it was formed.

[0121] Corona discharge treatment of 8W/(m² and min) is performed on the undercoating layer B-1 and the metallic-oxide particle layer 6. Furthermore, on the undercoating layer B-1 Said coating liquid B-3 was applied so that it might become 0.1 micrometers of desiccation thickness, the undercoating layer B-3 was formed, the lubricating layer coating presentation 1 of said publication was applied on the metallic-oxide particle layer 6, and the film base 33 was produced with the configuration as shown in Table 1 and 2.

[0122] Furthermore, on said undercoating layer B-3, multilayer color sensitive material was produced completely like the example 1 publication, and photosensitive material 33 was produced. A processing process and processing liquid performed the development for the film base and photosensitive material which were produced completely like the example 1 publication.

[0123] except for changing into a configuration Table 1 - given in Table 4 to an example 34 and 35 examples 2 -- an example 2 -- the film bases 35 and 36 and photosensitive material 35 and 36 were completely produced similarly, and the development was performed.

[0124] Corona discharge treatment of 8W/(m² and min) is performed to both sides of the base material A obtained by the example 36 example 1 publication. Apply the metallic-oxide particle layer coating presentation 2 given in Table 4 to one field so that it may become 0.8 micrometers of desiccation thickness, and the metallic-oxide particle layer 2 is formed in it. Moreover, the metallic-oxide particle layer 2 which applies the metallic-oxide particle layer coating presentation 6 given in Table 4 to the field of another side of said base material A so that it may become 0.8 micrometers of desiccation thickness, and has an antistatic function in it was formed.

[0125] Corona discharge treatment of 8W/(m² and min) is performed on the metallic-oxide particle layer 2 and the metallic-oxide particle layer 6. Furthermore, on the metallic-oxide particle layer 2 Said coating liquid B-1 is applied so that it may become 0.8 micrometers of desiccation thickness, and the undercoating layer B-1 is formed. On the metallic-oxide particle layer 6 Apply the lubricating layer coating presentation 1 of said publication, and corona discharge treatment of 8W/(m² and min) is further performed on the undercoating layer B-1. Said undercoating layer B-3 was applied so that it might become 0.1 micrometers of desiccation thickness, the undercoating layer B-3 was formed, and the film base 34 was produced with the configuration as shown in Table 1 and 2.

[0126] Furthermore, on said undercoating layer B-3, multilayer color sensitive material was produced completely like the example 1 publication, and photosensitive material 34 was produced.

[0127] A processing process and processing liquid performed the development for the film base 34 and photosensitive material 34 which were produced completely like the example 1 publication.

[0128] To the example of comparison ** - ** example 2, except changing the transparence magnetic layer coating presentation 1 into a configuration and a coating presentation given in Table 1-4, film base **-** and photosensitive-material ** - ** were produced completely like the example 2, and the development was performed.

[0129] To the example of comparison ** - ** example 19, except changing the metallic-oxide particle layer coating presentation 1 into a configuration and a coating presentation given in Table 1-4, film base **-** and photosensitive-material ** - ** were produced completely like the example 19, and the development was performed.

[0130] Furthermore, evaluation shown below was performed and the result was shown in Tables 5 and 6.

[0131] evaluation approach (1) optical-density Konica Corp. make -- using cherry densimeter PDA-65, using the interference filter which penetrates blue light, incidence of the light of specific wavelength was carried out at right angles to a paint film, and the absorption of light by this paint film was computed.

[0132] (2) Turbidity was measured using the SEP-PT-501D mold made from Turbidity Mitsubishi Kasei

Industry.

[0133] (3) By the signal input method indicated by the evaluation world public presentation No. 04205 [90 to] of a magnetic-recording output error, output actuation was carried out for the photographic film which carried out the magnetic input only at once 500 times by the magnetic head after development before development from the back layer, and the count in which the error was made was shown. In addition, an error makes the 1st output value 100%, and is less than 70% of case to it.

[0134] (4) the product made from surface Specific resistance Kawaguchi Electrical machinery -- it measured using teraohm meter VE-30 under the conditions of applied-voltage 100V, 23 degrees C, and 20%RH.

[0135] (5) Magnetic-recording playback was repeated 1000 times using the magnetic recorder and reproducing device of the format indicated by the U.S. Pat. No. 5,021,820 number at the side which applied the transparence magnetic layer of the photosensitive material put in the endurance cartridge, and the head load. The front face of the side which applied the transparence magnetic layer of the photosensitive material after a trial was observed by one 100 times the microscope scale factor of this, the existence of a blemish was investigated, and the following evaluations were performed.

[0136] A: with no crack -- those with whole C:magnetic-head contact section surface crack with B:2-3 cracks, in addition a crack are the collapse or the things which can delete, come out and exist and can be checked by one 100 times the scale factor of this of the front face which can be checked in the transit direction of the magnetic head.

[0137]

[Table 5]

実施例	フィルムベース				写真感光材料				耐久性
	現像前		現像後		現像前		現像後		
	光学濃度	濁度 (ppm)	光学濃度	濁度 (ppm)	磁気入出力 エラー(回数)	表面比抵抗 (Ω/sq)	磁気入出力 エラー(回数)	表面比抵抗 (Ω/sq)	
実施例1	0.19	15.4	0.20	15.7	3	8.8×10^8	3	9.2×10^8	B
実施例2	0.19	15.2	0.19	15.4	3	9.3×10^8	4	9.1×10^8	B
実施例3	0.19	15.1	0.19	15.2	4	9.1×10^8	3	8.9×10^8	B
実施例4	0.20	14.2	0.19	15.3	4	8.9×10^8	4	8.7×10^8	B
比較例①	0.25	21.3	0.24	22.0	8	9.0×10^8	9	9.2×10^8	C
実施例5	0.19	15.1	0.19	15.6	3	8.9×10^8	3	9.0×10^8	B
比較例②	0.23	24.8	0.24	23.9	10	9.3×10^8	10	9.0×10^8	B
実施例6	0.20	16.0	0.19	15.3	3	8.9×10^8	3	9.1×10^8	B
実施例7	0.19	15.4	0.20	15.8	3	9.4×10^8	3	9.3×10^8	B
実施例8	0.19	15.5	0.19	15.9	3	9.0×10^8	3	9.4×10^8	B
比較例③	0.24	19.9	0.23	21.2	9	8.7×10^8	8	8.8×10^8	C
実施例9	0.19	15.3	0.20	15.8	3	8.8×10^8	3	8.9×10^8	B
実施例10	0.19	15.8	0.19	15.7	3	9.4×10^8	3	9.5×10^8	B
実施例11	0.20	15.1	0.19	15.4	3	9.3×10^8	4	9.4×10^8	B
実施例12	0.19	15.4	0.19	15.8	4	9.0×10^8	4	9.1×10^8	B
実施例13	0.20	15.8	0.19	16.0	3	9.5×10^8	3	8.9×10^8	B
実施例14	0.20	15.9	0.21	15.1	4	9.2×10^8	3	1.1×10^9	B
比較例④	0.23	21.3	0.24	22.0	8	1.1×10^9	8	1.0×10^9	C
実施例15	0.19	15.7	0.19	15.8	2	1.3×10^9	1	1.6×10^9	B
実施例16	0.18	15.8	0.18	15.3	3	2.2×10^9	3	1.5×10^9	B
実施例17	0.17	15.3	0.18	15.4	3	1.7×10^9	3	1.7×10^9	B
実施例18	0.20	14.9	0.19	15.0	4	9.9×10^8	3	9.7×10^8	B
比較例⑤	0.23	22.8	0.24	22.7	11	9.4×10^8	10	9.2×10^8	C

[0138]

[Table 6]

実施例	フィルムベース				写 真 感 光 材 料				耐久性
	現 像 前		現 像 後		現 像 前		現 像 後		
	光 学 濃 度	濁 度 (ppm)	光 学 濃 度	濁 度 (ppm)	磁気入出力 エラー(回数)	表面比抵抗 (Ω/sq)	磁気入出力 エラー(回数)	表面比抵抗 (Ω/sq)	
実施例19	0.20	16.0	0.20	16.1	4	9.5×10 ⁸	3	9.5×10 ⁸	B
実施例20	0.19	15.4	0.19	15.3	3	9.1×10 ⁸	3	9.5×10 ⁸	B
比較例⑥	0.24	22.3	0.24	22.8	10	9.4×10 ⁸	11	9.1×10 ⁸	B
比較例⑦	0.24	22.0	0.23	21.9	9	8.8×10 ⁸	11	9.0×10 ⁸	B
比較例21	0.19	15.8	0.19	15.2	3	2.4×10 ⁸	4	1.8×10 ⁸	B
実施例22	0.20	16.0	0.19	15.7	4	8.6×10 ⁸	4	9.0×10 ⁸	B
実施例23	0.19	15.2	0.20	15.5	3	9.2×10 ⁸	3	9.5×10 ⁸	B
実施例24	0.19	16.1	0.19	15.8	3	9.3×10 ⁸	3	9.2×10 ⁸	B
比較例25	0.20	15.3	0.19	15.2	3	9.0×10 ⁸	4	9.1×10 ⁸	B
実施例26	0.20	15.8	0.19	16.0	1	1.2×10 ⁹	1	1.1×10 ⁹	B
実施例⑧	0.25	21.9	0.24	22.3	9	1.0×10 ⁹	9	8.9×10 ⁸	B
実施例27	0.17	15.7	0.18	15.5	3	9.8×10 ⁸	3	9.9×10 ⁸	B
実施例28	0.18	15.8	0.17	15.7	3	9.7×10 ⁸	3	1.2×10 ⁹	B
実施例29	0.19	14.8	0.19	14.6	3	9.4×10 ⁸	4	9.8×10 ⁸	B
比較例⑨	0.23	22.4	0.23	22.7	8	1.9×10 ⁹	8	1.8×10 ⁹	B
実施例30	0.19	15.5	0.20	15.8	4	8.9×10 ⁸	3	9.5×10 ⁸	B
実施例31	0.19	15.6	0.19	15.7	1	1.6×10 ⁹	2	1.8×10 ⁹	B
実施例32	0.20	15.1	0.19	15.3	3	1.9×10 ⁸	3	1.7×10 ⁸	B
実施例33	0.19	15.9	0.19	15.6	3	1.2×10 ⁸	3	1.8×10 ⁸	B
実施例34	0.19	14.7	0.19	14.6	0	9.7×10 ⁸	0	9.9×10 ⁸	A
実施例35	0.16	15.1	0.17	15.4	1	9.1×10 ⁸	2	9.3×10 ⁸	B
実施例36	0.19	16.0	0.19	15.1	3	9.3×10 ⁷	3	9.2×10 ⁸	B

[0139] The photosensitive material 1-36 obtained from Tables 5 and 6 by this invention is transparent in photograph, and sharp nature and graininess are excellent, they is excellent in magnetic input-output behavioral characteristics and antistatic nature with the outstanding dispersibility, endurance degradation by friction and wear by the magnetic head is prevented, and it turns out that it is the thing in which after a development has neither degradation nor dust adhesion and which is completely satisfactory in photograph.

[0140]

[Effect of the Invention] According to this invention, the 1st can be provided with an outstanding silver halide photosensitive material in which transparency required as a photosensitive material, the Takayasu quality of the magnetic I/O with the magnetic powder volume of ultralow volume, prevention of endurance degradation by friction and wear of the magnetic head, prevention of the desorption of a magnetic powder metallurgy group oxide particle with development liquid, prevention of foaming at the time of coating production, and deletion of after treatment, such as vacuum degassing and ultrasonic degassing, are possible.

[0141] The 2nd can be provided with an outstanding silver halide photosensitive material which is excellent in antistatic nature and does not have the dust adhesion after a development.

[0142] An ingredient and a process move preparation of a transparence magnetic layer and a metallic-oxide particle layer to a drainage system, in respect of an environmental cure, and safety and the cure against flame proofing, it is more safe for the 3rd, and it can be provided with silver halide photosensitive material with cheap environmental costs.

[0143] The 4th can be provided with the silver halide photosensitive material with which the cost cut by reduction of the process load by reduction, reduction of the amount of the ingredient used, etc. of the count of spreading at the time of production, the count of desiccation, etc. was measured by containing a ferromagnetic particle and a metallic-oxide particle in the same layer.

[Translation done.]